

MATT LANE examines a large projection of a computer model depicting polymer-coated silica nanoparticles. Here, the two 5-nanometer particles make contact in a water solution. Sandia researchers used molecular dynamics simulations to measure the forces between coated nanoparticles that were too small to measure experimentally. The observation of strongly asymmetric

coatings led Matt (1435) and colleague Gary Grest (1114) to further study the coating properties on very small particles. These results were featured as the cover article in the June 11, 2010, issue of *Physical Review Letters*. Read more about their work in a story on **page 5**.

(Photo by Randy Montoya)

## Sandia computational ideas awarded \$2.6 million in grants from Office of Science



Four Sandia researchers have won three-year grants totalling \$2.6 million to pursue their computational research proposals.

Walter Polanksy, acting director of Computational Science Research and Partnerships, a component group of DOE Office of Science's Office of Advanced Scientific Computing Research, notified the following researchers of grant awards:

(Continued on page 9)



### Inside . . .



Sandia pioneer and Hall of Fame inductee Jack Howard, who was instrumental in the establishment of the California site, has passed away at age 88. See story on **page 4**.

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The coming change in health care benefits:



Pre-Open Enrollment presentations scheduled for retirees and surviving spouses. See **page 10** for details.

# Sandia LabNews

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Managed by Lockheed Martin for the National Nuclear Security Administration



## Report: Sandia Mixed Waste Landfill not source of trace solvent detected in groundwater



DON SCHOFIELD (4133, left) and Mike Mitchell (6765) check on the establishment of the new vegetation on the Mixed Waste Landfill cover in this photo from late 2009. Construction on the cover was completed a year ago. A recent investigation has found the landfill is not the source of trace amounts of toluene detected in nearby groundwater samples. (Photo by Randy Montoya)

By Heather Clark

An investigation by DOE and Sandia has concluded the Mixed Waste Landfill is not the source of very low concentrations of toluene detected in groundwater samples collected from monitoring wells at the site. Toluene is a common solvent found in paint thinners, gasoline, and other consumer products.

The results of the investigation were published in the *Mixed Waste Landfill Toluene Investigation Report* and submitted in August to the New Mexico Environ-

ment Department (NMED), which requested the investigation in April.

The Mixed Waste Landfill was established in 1959 as a disposal area for low-level radioactive waste generated by Sandia's research facilities.

The toluene concentrations detected in groundwater samples near the 2.6-acre site are significantly lower than the federal drinking water standard for toluene of 1,000 parts per billion. And, the concentrations are

(Continued on page 5)

## That's that

Came across a news item the other day that I found just astonishing. Actually, my wife called my attention to it. The US in 2009 experienced the lowest number of traffic fatalities in 60 years. When she read the item to me, I said, "You mean per capita?" Nope. In raw numbers. Think about that for a minute. According to some data I tracked down online – hope I'm doing all my math right here – there are twice as many people, five times as many vehicles, and more than three times as many licensed drivers in the US today as there were 60 years ago, and we're driving way more: 458 billion miles 60 years ago, perhaps three trillion miles today.

For all of that, the US had 33,000 deaths on its roads in 1950; in 2009, 33,808 people lost their lives on American streets and highways. The fatality rate per 100 million miles is 1.13. You've all heard the old saw, the one that goes "You're more likely to get killed on the drive over here than you are to die on that roller coaster," or whatever risky enterprise you're about to undertake. Well, no. While every fatality on the highways is a terrible loss, the fact remains – and it's borne out by the numbers – that driving just isn't particularly deadly anymore.

What does this have to do with Sandia? Nothing directly. But indirectly, a lot. Why? To me, these numbers tell a story of the triumph of science and engineering. Safety engineers, traffic engineers, highway engineers, automotive engineers, social engineers, scientists from many disciplines – all have had a hand in transforming our vehicle fleet from killing machines to safe and reliable transportation.

\* \* \*

And cars aren't just safer; they last a lot longer. When I was a kid, if you got 50,000 miles out of a vehicle before it started to fall apart, you were lucky. Today, cars with 100,000 miles are just getting broken in. The 100,000-mile car in the 1950s was sort of like the 100-year-old man: The local newspaper would send a photographer and reporter to interview the proud owner of this extraordinary curiosity about the secrets of his car's longevity. The money quote was always something along the lines of: "If I'da known she was gonna last this long, I woulda taken better care o' her." Yuk yuk.

Cars stay in families now for half a generation and more just as a matter of course, and in that time, you tend to get attached to each other. Granted, sometimes it's a love/hate relationship but usually I feel about my 2000 Isuzu Trooper the way Luke Skywalker felt about R2D2. When one of the techs in the X-Wing fighter bay asked Luke if he wanted to get rid of that old R2 unit, Luke was indignant: "Not on your life! That little droid and I have been through a lot together." I know just what he meant.

\* \* \*

But in all seriousness, the latest statistics on US traffic fatalities are an incredible testimonial to the way a technology matures and gets refined and just gets better and better. And that doesn't happen by accident. So to the scientists and engineers out there, thanks. You may not have had a direct hand in the auto business (although in fact Sandia does have great working relationships with the industry), but you've helped advance the state of the art. To that extent, at the very least, you've made me feel a lot better about seeing my kids behind the wheel of a car than my parents felt when I first started to drive.

\* \* \*

Mind one more little bit about these traffic numbers? While it's great news that the death toll on the nation's highways has been going down pretty steadily for a while, it still strikes me as interesting that we accept those 33,000 fatalities as a kind of collateral damage we're willing to put up with. I mean, an avian flu outbreak that claimed 33,000 lives would be considered a serious national emergency, and a terrorist attack that killed that many people would be a provocation bigger than 9/11 – and we all know what the nation's response to that has been. But we accept those traffic deaths. Why? Because, I think, we perceive the individual risk to our own person to be vanishingly small – and we don't want to give up our cars. I do understand.

See you next time.

– Bill Murphy, (505-845-0845, MS0165, wtmurph@sandia.gov)

## Employee death

# Mel Loran will be missed mostly because she was such a beautiful person

Mel Loran (1415) died on Sept. 13. She was 59 years old and had been at Sandia more than 16 years.

"For more than a decade, Mel worked as an office administrative assistant (OAA) in the mathematics and computing research organization (1410)," says her manager Bruce Hendrickson (1414). "In that time, she worked with many managers and staff, befriending all. Her long service made her a cornerstone of the organization, able to solve any problem and answer any question. Mel was simply outstanding at what she did, and always eager to help in any way she could.

"Mel always came to work with a smile on her face, and brightened the lives of all around her. She had a warm and gentle personality."

Scott Mitchell (1415) was Mel's manager for two years. "Mel handled four departments," he says. "I could give her high-level direction and she would figure out the details that others would often have to come back and ask me about.

James Stewart, Mel's manager in Dept. 1411, says, "I think the question isn't 'What was her job?' but 'What wasn't her job?' She did almost everything and anything around here. Her work station was right next to my office, and how popular that area was. Many people from across our organization would wander in for a friendly chat, to get or offer opinions and advice on just about anything, and more importantly, to just lighten the day. Mel will be greatly missed for many reasons, but mostly because she was such a beautiful person.



MEL LORAN

## Treated the office like her home

"In the last month, there were issues with the building power supply and we lost the ability to use the microwaves. Mel came up with a solution. She found some extra out-of-the-way spaces where we could plug them. She treated the office like her house and took care of it to make sure it was pleasant, organized, and functional."

Her coworker Brett Bader says Mel was a very sweet woman. "She worked quietly and diligently and kept the organization running smoothly," he says. "She shied away from the limelight or well-deserved recognition."

Amy Martin (1415) says Mel was very respected. "She was all the corporate values rolled into one."

Cy Santos, Mel's friend, says that a couple of days before her death, she told Cy that she appreciated all her coworkers. "She had a gentle spirit and was very soft-spoken," says Cy. "She loved to go to rock concerts, movies on base, and dollar bowling night. Mel loved the outdoors and loved hiking, especially in Utah."

"It's hard to put into words how wonderful Mel was," says her friend Tina Wardle (8944). "It always seemed like she knew everything. Anytime I called her for help or had a question, she always had the answer or knew where to get it. She was in her same job since she came to Sandia. She never wanted to move.

## Always there for you

"As a friend, Mel was the most kind-hearted, loving person. She was always there for you. She loved her friends and family and would do anything for them. She loved animals and especially her cats, her most recent cat, Chloe. Mel loved traveling and going on trips, especially the trips she went on with her daughter, Amy Seaborn (5902)."

"Mel was very active," says Bill Goldman (9341). "On days when she was in the office all day, she would walk around the building and go up and down each stairwell several times as she passed them. At a team awards ceremony, she was recognized for her exceptional work, and was given a pedometer, as were all the other recipients. She is the only one I've seen regularly use hers; she always knew how close she was to her 10,000 steps on any given day.

"She was adventurous and was an extra in several films. She had plans of touring the country in an RV when she retired."

Tina adds, "I can't believe my friend is gone. I will truly miss her and will cherish all the memories. We had some great times. We laughed and cried a lot. She will always be in my heart."

— Iris Aboytes



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# October to usher in access changes along East Avenue

**New lane, more accessible CRF first physical changes with Livermore Valley Open Campus (LVOC) concept**



THE HILL, a popular route for recreational and fitness walkers, was thought to be on the verge of permanent closure for safety and security reasons. After an outcry from regular users, however, it may get a new lease on life.

By Mike Janes

On Monday, Oct. 4, the Livermore Valley Open Campus (LVOC) becomes less of a concept and more of a physical reality when access changes along East Avenue take effect.

NNSA and DOE leadership approved a “mission needs concept” for the LVOC in 2009, allowing Sandia/California and Lawrence Livermore National Laboratory to explore the conceptual development of design options required to reconfigure a portion of the two labs into a more open layout. The changes along East Avenue represent the completion of the “Phase One” milestones laid out in the initial plan.

Designed to make entry into Sandia easier and more efficient — particularly for external collaborators — a third lane along East Avenue will open at the eastern (Greenville Road) end of the street. This change means that, as of Oct. 4, all vehicular access to Sandia’s Combustion Research Facility (CRF) and other nearby portions of the site (including access by members of the workforce) will be via Greenville Road only. Emergency vehicles will continue to be able to access this portion of the site from the station across the street at Lawrence Livermore lab.

Staff, students, visiting researchers, and others who drive to work will no longer come to the CRF by entering East Avenue at Vasco Road. This includes members of the workforce who park in lots on the east side of the site, such as those at the Chemical and Radiation Detection Laboratory (CRADL, or Bldg. 968) and outside the medical offices.

Those entering the site on the east side at East

Avenue and Greenville Road will pass by an unstaffed kiosk before continuing down to Thunderbird Lane (the road that turns in toward the CRF). Signage will direct drivers to the CRF parking lot.

The primary options for accessing the CRF by vehicle are now as follows:

- When driving eastbound on Highway 580, take the Vasco exit, turn left from Vasco onto Patterson Pass Road, turn right on Greenville, and turn right onto East Avenue to proceed toward the CRF. Or, take the Greenville Road exit off of 580.
- When driving westbound on 580, take the Greenville Road exit and head south down to a right turn onto East Avenue.
- If approaching from the south, take Tesla Road and turn north onto Greenville Road before turning left onto East Avenue.

With the physical modifications, the CRF will become a “General Access Area” (GAA) as opposed to a “Property Protection Area” (PPA). The building will have a receptionist stationed in the lobby to obtain information from visitors and process badges. Other CRF buildings, such as those that lead to CRF laboratories, will require access via a badge reader. The current badge reader at the entrance to the CRF lobby will be engaged after normal business hours when the receptionist is off duty.

Pedestrian access to the CRF will generally remain the same. For those riding bicycles to the CRF, an access booth will open later in October along East Avenue that will allow bicyclists to gain entrance into the facility from the west.

With the changes, says Bob Carling (8300), the

## ‘The Hill’ resurrected?

Originally slated to be closed for safety and security reasons, the Sandia/California “Hill,” popular with Sandia and LLNL recreational walkers, may still have life.

Prompted by a small but vocal outcry from members of the workforce who use the hill as a walking or running route, Sandia leadership is developing an option for keeping it accessible to Labs employees. The most likely scenario is a one-way turnstile that could be installed sometime during the new fiscal year, says site operations director Pat Smith (8500).

“The safety and security of our labs is paramount in whatever solution we are able to implement,” says Mary Behrendt (8527), manager of Health, Benefits, and Employee Services (HBE) in California.

A solution may take time, Mary says, but she has assured the workforce that management is determined to find the best long-term outcome.

In the meantime, HBE has teamed with Facilities to create walking alternatives, and regular group walks sponsored by Sandia/California’s Life Design Center continue to take place. For more information, visit <http://info.sandia.gov/centers/8500/hr/hbe/events>.

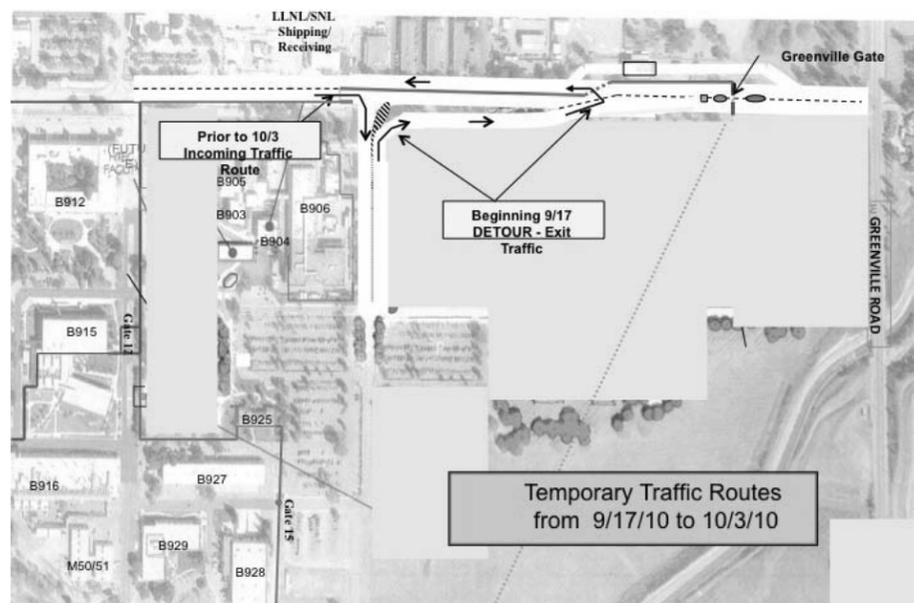
## Sandia California News

LVOC will take an important step in creating a laboratory campus that is more inviting and open to scientific collaborators.

“Before, we [the CRF] may not have been able to host the CEO of Toyota at a moment’s notice. Badging rules for non-US citizens would have made it difficult or prevented it altogether. Now, that’s changed,” Bob says. In the spirit of a more accessible campus, he says, visitors to the CRF will no longer need to make badging arrangements prior to their arrival, though for processing purposes it is advised that visitors and their hosts give 24-hour notice.

Don Charlesworth (8511) and members of the Sandia/California security team have taken steps to ensure that the new access changes on site will include appropriate security measures. A risk assessment focused on the CRF and surrounding area has been completed in consultation with an outside firm, and a new GAA security plan (as well as an updated building security plan for the CRF) will be in place by the time the changes take effect in October.

Other changes are less visible but will impact delivery traffic. The site’s Gate 15 (near Bldg. 928) is now closed to regular vehicle traffic, and Gate 10 (near Bldg. 964) has become the primary vehicle access gate to the PPA. Those vehicles requiring access to the PPA are now directed to Gate 10 via Sandia Drive (the outer loop road).



# Sandia mourns death of former executive VP, colleague, and founder of Labs' California site Jack Howard



JACK HOWARD, left, during his last visit to Sandia in July 2010 to be inducted as the third member of the Labs' Hall of Fame. Joining Jack at the table of honor were his daughter, Melissa Howard (in foreground), and, clockwise from Jack, former Executive VP Orval Jones, former Director Charlie Winter, Center 8100 Director Peter Davies, and first-generation Sandian Leon Smith. In the center background are Div. 9000 VP Joe Polito and former executive VP John Stichman. (Photo by Randy Montoya)

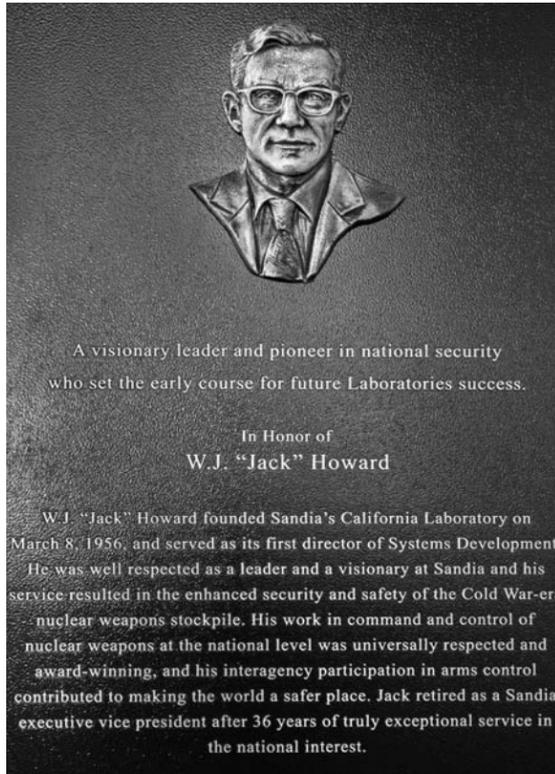
**W.J.** "Jack" Howard, a former executive VP at Sandia who was a valued national adviser on US nuclear policy, passed away Sept. 13 at the age of 88.

During his career, Jack, who lived in Albuquerque, was responsible for the early recognition that US nuclear weapons needed built-in controls to prevent unauthorized or inadvertent arming. He also participated in early nuclear weapons tests and was the first director of Sandia's site in Livermore, Calif.

"Jack Howard's contributions to Sandia and national security are immeasurable, from his nuclear weapons work to his advocacy of nuclear weapons safety to his leadership establishing Sandia's California site. His actions over a 36-year career shaped the Laboratory into what it is today, and for that we are grateful," Labs Director Paul Hommert says. "While we are saddened by this news, we will always remember Jack's standards of excellence, his leadership and his national service."

Shortly before his death, Jack became the third Sandian to be inducted into the Laboratories' Hall of Fame for his many contributions to Sandia. Jack attended a celebratory luncheon and ceremony at the Labs in June along with dozens of former colleagues, friends, and family.

"Jack made tremendous contributions to US national security during his years at Sandia. He was an extraordinary leader, dedicated to excellence and public service," said Steve Rottler, Div. 1000 VP and chief technology officer who nominated Jack for the Hall of Fame. "With his family, we mourn Jack's passing, but also celebrate his legacy and the lasting imprint he has



left on our laboratory and the nation." Jack retired from Sandia in 1982 after serving nine

years as executive vice president.

Prior to joining Sandia, Jack graduated with a degree in mechanical engineering from what is now New Mexico State University in Las Cruces and served in World War II. Jack survived a mountain airplane crash that killed the pilot by hiking for six days with a shattered kneecap until he found help.



JACK HOWARD c. 1980

In 1946, Jack joined the Z Division of Los Alamos National Laboratory, which is now Sandia.

Over the years, Jack acquired a long list of achievements in weapons work at Sandia. He directed the ordnance engineering design and development of the first Polaris missile warhead.

Jack was the motivating force behind the concept of the nuclear warhead and delivery system, which led to what is known as the "Davy Crockett" infantry weapon system. The system was designed for use by the US infantry in Europe against Soviet troops during the Cold War.

But safety and control of nuclear weapons also mattered to Jack. To prevent unauthorized detonation of nuclear weapons, Jack recognized early the need for built-in control of the arming sequence of US nuclear weapons. He participated in preliminary design of the Permissive Action Link (PAL) system that resulted. The PAL system is a coded switch inside a nuclear weapon that blocks the arming signal and requires an order from the president to pass through the proper channels to the officer-in-charge, who then would enter the code.

Perhaps Jack's most visible achievement to the public was Sandia's California site. Jack was assigned in 1956 to inaugurate the new laboratory to provide ordnance engineering support to what is now known as Lawrence Livermore National Laboratory.

Jack also was recognized nationally for his nuclear weapons expertise. From 1963-1966, he served as assistant to the secretary of defense for atomic energy at the Department of Defense and was the chairman of the Atomic Energy Commission's Military Liaison Committee. During this time, he assisted with ballistics support to locate a missing nuclear weapon near Palomares, Spain, after the collision of a B-52 and tanker aircraft during a refueling operation.

Former Defense Secretary Robert McNamara awarded Jack the Department of Defense Medal for Distinguished Public Service for his work.

Jack also served as a delegate to the Strategic Arms Limitation Talks in Geneva, Switzerland, in 1976.

Jack was the third inductee into Sandia's Hall of Fame after former VP Glenn Fowler and Executive VP Robert Henderson. — Heather Clark

## 'Hydraulic subterfuge' gave boost to Sandia/California site

### Jack Howard's account of site's founding captures free-wheeling spirit of the times

Note: Jack Howard wrote the following account of the establishment of the Sandia/California site for a special 40th anniversary Sandia history publication, Reflections for Tomorrow.

The decision to have Sandia provide ordnance engineering for the emerging weapons program at the University of California Radiation Laboratory (UCRL) wasn't automatic. There were others interested in the job. The Lawrence Laboratory (then called UCRL, or sometimes by the local citizenry, "the 'tomic plant") owed its existence, at least in some measure, to the perceived need for a competitor to the New Mexico complex.

However, in February 1956, Sandia was designated to join UCRL in a manner similar to that which existed between Los Alamos and Sandia in New Mexico. By mid-year, we occupied a pink building in UCRL's compound at the wartime Naval Air Station at Livermore. Most of us were transplants from Albuquerque, but we started a vigorous recruiting program and began our own buildings across East Avenue, where the WAVES used to live. Soon, the "Livermore Branch" developed an identity of its own.

Sometimes, we must have seemed to exaggerate our independence, however, and were cautioned to "sing from the same sheet of music" by our Albuquerque colleagues. Trouble was, UCRL was newly into the weapons business and sought

to make a quick reputation by being bold and innovative. Competition was the keynote. So we responded to the "same music" admonition by noting that, in Livermore, we had to harmonize with a Heavy Metal group.

We hoped for some sort of balance between absolute autonomy (a complete duplication of all Albuquerque facilities and capabilities) and the other extreme of becoming no more than a sort of liaison office. We knew we'd need some test facilities, for example, but we'd come back to Albuquerque to use the rocket sled track. In anticipation of funding requirements for as-yet-undefined test gear, we stuck a \$200,000 item in our budget wish list labeled "hydraulic subterfuge." It survived! And we had some money to start buying shake machines and cold boxes.

The townspeople viewed us a bit skeptically. There'd been one technical group that moved to Livermore, only to fold up overnight and leave a hole in the local economy. But we joined energetically into community affairs. Leo Gutierrez sired halfbacks for the Livermore Cowboys; Lee Hollingsworth and Will Jamieson pushed through a new hospital. We managed to overcome local reluctance to spend money on a new sewer plant. FHA wouldn't make any more house mortgages until the plumbing could be depended on, and we needed mortgage money!

Sandia Livermore had the opportunity to shape its own future. Sometimes, what you get is what you play for.



The March 23, 1956 Lab News announces the launch of the Sandia/California site.

# Nanoscale particles resist full encapsulation, Sandia simulations show

**Formerly unrealized defect results in clumping and unwanted chemical interactions**

By Neal Singer

It may seem obvious that dunking relatively spherical objects in a sauce — blueberries in melted chocolate, say — will result in an array of completely encapsulated berries.

Relying on that macroworld concept, fabricators of spherical nanoparticles have similarly dunked their wares in protective coatings in the belief such encapsulations would prevent clumping and unwanted chemical interactions with solvents.

Unfortunately, reactions in the nanoworld are not logical extensions of the macroworld, Sandia researchers Matthew Lane (1435) and Gary Grest (1114) have found.

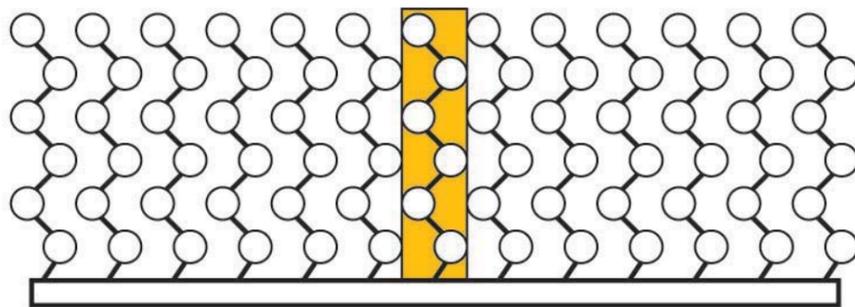


FIG. 1

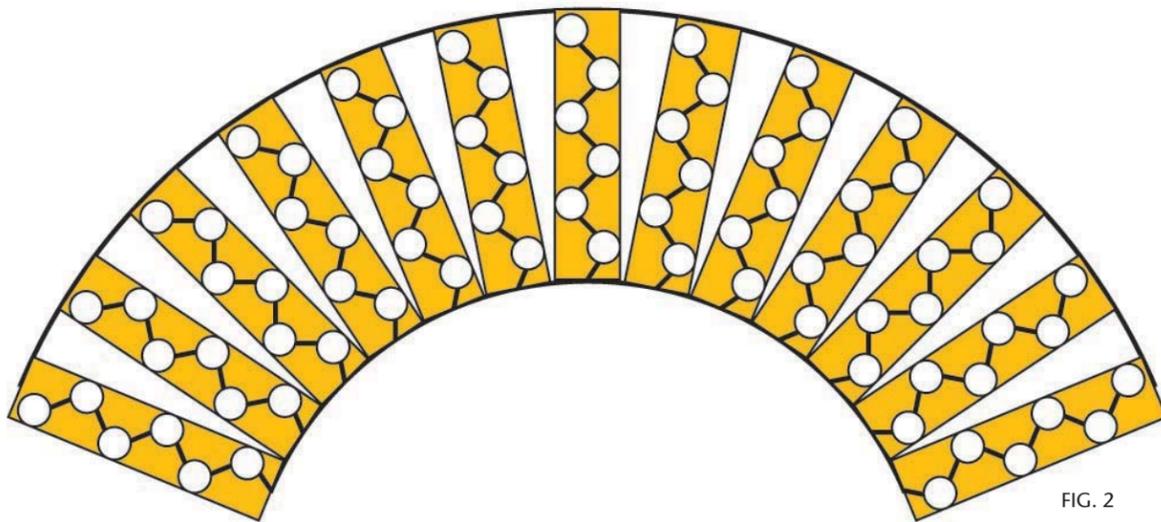


FIG. 2

THE PROTECTIVE CAPABILITIES of a chain-link molecular coating are lessened when, instead of attaching to a flat surface to form an unbroken wall (fig. 1), the radius of the nanoparticle is so small that the extreme surface curvature opens spaces between the protective molecules (fig. 2).

provokes the formation of a series of louvers rather than a solid protective wall (see illustration above).

"We've known for some time now that nanoparticles are special, and that 'small is different,'" says Matt. "What we've shown is that this general rule for nanotechnology applies to how we coat particles, too."

"It's well-known that aggregation of nanoparticles in suspension is presently an obstacle to their commercial and industrial use," says Carlos Gutierrez, manager of Surfaces and Interface Sciences Dept. 1114. "The simulations show that even coatings fully and uniformly applied to spherical nanoparticles are significantly distorted at the water-vapor interface."

As the researchers put it in their paper, "Spontaneous Asymmetry of Coated Spherical Nanoparticles in Solution and at Liquid-Vapor Interfaces" . . . "The asymmetric response appears to be reinforced when particles are at a surface."

"You don't want aggregation because you want the particles to stay distributed throughout the product to achieve uniformity," says Gary. "If you have particles of, say, micron-size, you have to coat or electrically

charge them so the particles don't stick together. But when particles get small and the coatings become comparable in size to the particles, the shapes they form are asymmetric rather than spherical. Spherical particles keep their distance; asymmetric particles may stick to each other."

However, the simulation's finding isn't necessarily a bad thing, for this reason: Though each particle is coated asymmetrically, the asymmetry is consistent for any given set. Said another way, all coated nanoscopic sets are asymmetric in their own way.

A predictable, identical variation occurring in every member of a nanoset could open doors to new applications.

"What we've done here is to put up a large 'dead end' sign to prevent researchers from wasting time going down the wrong path," says Matt. "Increasing surface density of the coating or its molecular chain length isn't going to improve patchy coatings, as it would for larger particles. But there are numerous other possible paths to new outcomes when you can control the shape of the aggregation."



In a cover article this past summer in *Physics Review Letters* (see cover image above), the researchers described using molecular dynamics simulations at the New Mexico Computational Center supercomputer to show that simple coatings are actually incapable of fully covering each spherical nanoparticle in a set. Instead, because the diameter of a particle may be smaller than the thickness of the coating protecting it, the geometry of the particle surface as it rapidly drops away from its attached chainlike coating molecules

## Mixed waste landfill

(Continued from page 1)

very close to the detection limit of 0.25 parts per billion set by the independent analytical laboratory subcontracted by Sandia.

This investigation also indicates that the analytical laboratory that tested the groundwater samples is the source of toluene reported in some samples.

"The toluene groundwater results reflect the ubiquitous nature of toluene and the very low analytical detection limit (of 0.25 parts per billion)," the report's executive summary states. "The detections do not represent a release to the environment or widespread low-concentration toluene contamination in the regional aquifer."

Toluene is a common volatile organic liquid, which means it easily turns to vapor at ambient temperatures. It is present in many workplaces and consumer products and has been identified by the US Environmental Protection Agency as a common laboratory contaminant. It is also released into the atmosphere by manufacturing plants and automobile emissions.

Toluene is present in urban air at very low concentrations of 0.01 to 0.05 parts per million — in other words, at concentrations higher than was detected in the groundwater samples collected near the Mixed Waste Landfill.

The extensive investigation on the source of the toluene included a review of the results from all previous Mixed Waste Landfill field investigations; a review of soil-vapor surveys conducted in 1994 and 2008; a review and analysis of all Sandia groundwater monitoring results from 2001 through April 2010; and evaluation of

*"The toluene groundwater results reflect the ubiquitous nature of toluene and the very low analytical detection limit (of 0.25 parts per billion)."*

— *Mixed Waste Landfill Toluene Investigation Report*

the possible introduction of toluene from the sampling equipment and process, the drilling and well construction materials and processes, and during testing at the analytical laboratory. DOE and Sandia also completed additional groundwater studies as requested by NMED.

Results of the current and previous investigations show that toluene has never been found in concentrations that would affect regional groundwater, which occurs at a depth of 500 feet, so the chemical is not considered a significant contaminant at the site.

Toluene has been sporadically detected in groundwater samples collected prior to 2008 and continues to be detected in groundwater samples from all four groundwater monitoring wells installed in 2008, including the background well, at very low concentrations, typically less than one part per billion.

The Mixed Waste Landfill is located in Technical Area 3 in the west-central part of Kirtland Air Force Base about five miles southeast of the Albuquerque airport. For the past 20 years, groundwater monitoring beneath the site has demonstrated that the materials disposed in the landfill have not contaminated the groundwater. The landfill stopped accepting waste in 1988.

DOE and Sandia, in coordination with the NMED, will continue to closely monitor the groundwater beneath the landfill and will continue testing for toluene.

# Carbon Cycle 2.0: Lawrence Berkeley National Lab Director Paul Alivisatos explains the initiative

By Patti Koning

On Wednesday, Aug. 3, Lawrence Berkeley National Laboratory (LBNL) Director Paul Alivisatos gave a Distinguished Lecture on "The Carbon Cycle 2.0 Initiative at Lawrence Berkeley National Laboratory." Alivisatos was named LBNL's director in 2009 after Steven Chu stepped down to become Secretary of Energy.

of various molecules, elements, and ultimately, the natural flow of carbon," Alivisatos said.

"We are faced today with a situation where we have tremendous needs — things like automobile batteries with three times today's energy density that can survive 15 years of deep discharges. What we have to achieve in the energy space is actually rather daunting. Societal needs in energy and the environment challenge basic science laboratories like ours to rise to a new level."

Energy, he said, is the largest industry in the world

energy efficiency.

Alivisatos touched on some of LBNL's key work in those areas.

"There is a tremendous need for energy analysis, and this is a capability we are working to build up," he said. "Here we are all imagining what the energy system is going to look like, but we tend to just think about the first step of deploying a technology. We are not yet good enough at thinking about how all these pieces interact as a complete system."

He pointed to the concept of "cool roofs" — painting rooftops white to locally reduce warming — as an example of the role of energy analysis.

"Imagine that solar arrays, photovoltaics, or artificial photosynthesis end up being deployed on a scale that actually is substantial in comparison with our total energy use," he said. "That might mean tens of millions of acres, so extrapolating a project to success — what happens if it works? What are the energy consequences and what are the environmental consequences? If you take a big chunk of red or tan desert and convert it to black there is a big heat island effect. You need to calculate that to understand the ultimate impact."

He discussed carbon sequestration, energy use in the developing world, energy storage, biofuels, and artificial photosynthesis — all of which face significant obstacles before they can have an impact on the future of energy usage.

All of these are also areas where LBNL, Sandia, and other national laboratories are doing groundbreaking research.

Alivisatos believes carbon sequestration will play a significant role in any future energy scenario. "It would be very difficult in the next few decades to make a complete wholesale change in the energy system that gets us off hydrocarbons altogether," he said. "The size of the infrastructure is so large and the turnover time is so long."

One problem with carbon sequestration is the high energy output to capture CO<sub>2</sub>. "This is an area where nanoscience can play a significant role," he said. "In the last 10 years, we've seen the invention of metallorganic frameworks in which it is possible to create binding sites that can be tuned very precisely to control the binding energy of the CO<sub>2</sub>."

LBNL is also working on technologies to enable denser batteries and artificial photosynthesis, both of which could be game-changers in the future of energy. To learn more about Carbon Cycle 2.0, visit <http://carboncycle2.lbl.gov/>.



LAWRENCE BERKELEY NATIONAL LABORATORY Director Paul Alivisatos explains the concept behind the Carbon Cycle 2.0 initiative during a Distinguished Lecture at Sandia California. (Photo by Randy Wong)

Carbon Cycle 2.0, Alivisatos said, is a multidisciplinary approach to developing ways to help restore the balance in Earth's carbon cycle, which has been adversely affected by human activity. The goal is to provide a scientific basis that in the near future could stabilize the carbon cycle — complete with human activity.

"Today we face a very special moment in the history of the Department of Energy and an incredible moment, really, in the history of the planet. For the first time in human history, human activity has become a player on the global scale in terms of the flux

and is sold very cheaply. "Here we have this incredible conundrum. To get where we need to go, we need very sophisticated technologies that we deliver on an enormous scale at a low cost. To call it a grand challenge is beyond what that phrase really means," he said.

At the center of the Carbon Cycle 2.0 concept, Alivisatos placed climate modeling and energy analysis. Spinning off from that are carbon capture and sequestration, biofuels, artificial photosynthesis, solutions for the developing world, and combustion. Tangentially related are energy storage, solar photovoltaics, and



## POW★MIA RUN



Team Kirtland began its annual prisoner of war and missing in action remembrance with a 24-hour POW/MIA vigil run Sept. 16 at Hardin Field on Kirtland Air Force Base.

The opening ceremony started at 9:45 a.m. More than 150 military and civilian volunteers kept the POW/MIA flag in motion around Hardin Field to honor those who have been prisoners of war or are missing in action.

The Team Kirtland runners delivered the POW/MIA flag to the New Mexico Veterans Memorial at 10 a.m. Sept. 17. The Kirtland AFB honor guard then posted the flag during the POW/MIA Remembrance Day ceremony, held each year on the third Friday of September. The event's keynote speaker was Col. Robert Maness, 377th Air Base Wing commander.

National POW/MIA Recognition Day is one of six days specified by law on which the POW/MIA flag shall be flown over federal facilities and cemeteries, post offices and military installations. The observance honors the commitment and sacrifice of POWs and MIAs throughout the nation's history. (Photo by Randy Montoya)



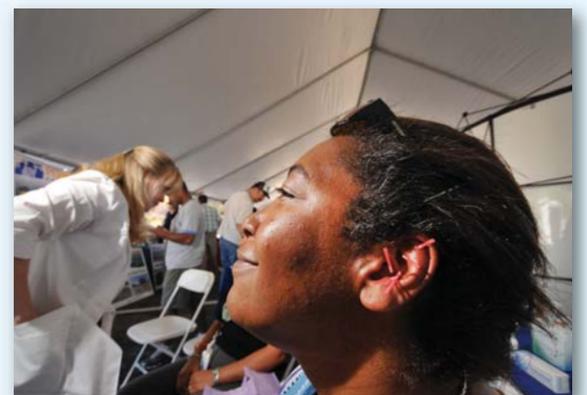
# Safe, Secure, Sustainable Fair

*Creating change for your life, your nation, and your planet*

Hundreds of Sandians turned out to see the latest in rescue vehicle technology, electric cars, and green building techniques at the first S<sup>3</sup>: Safe, Secure, Sustainable Fair. The Aug. 25 fair was a combination of the yearly Safety and Security and Earth Wind and Sun fairs. Coordinators say the goal was to help people find resources to live more sustainable, safer lifestyles.

More than 80 exhibitors participated in the S<sup>3</sup>, and many displays were interactive, including those for acupuncture, firearms safety, and alternative fuel use. Staying safe, both on the job and at home, was an important focus of the event. Two guest speakers gave presentations in the Steve Schiff Auditorium. Sandian Randy Fellhoelter's (4122) talk, "Shortcuts," focused on the importance of being aware of your surroundings and remaining vigilant about safety hazards in everyday activities. Marion Nestle, a professor at New York University in sociology and in the Department of Nutrition, Food Studies and Public Health, presented "Food for Health and Environmental Sustainability."

*Photos by Randy Montoya*



# Integrating biofuels and combustion engines vital for biofuel success, says Sandia-led report

By Mike Janes

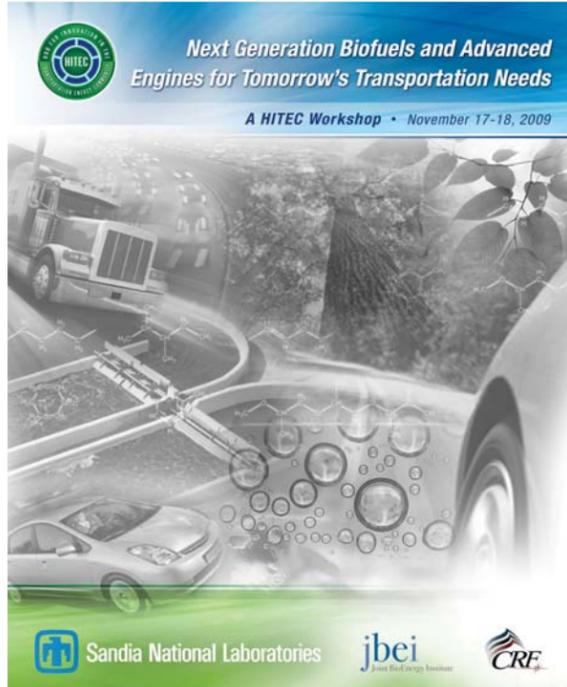
Transportation experts are proposing that the research and development of next-generation biofuels must be done in conjunction with the development of advanced combustion engines, if those biofuels are to become a reality and experience long-term success in the US transportation sector, according to a new report issued by Sandia.

The recommendations came out of a Sandia-hosted workshop held in the Bay Area late last year, "Next Generation Biofuels and Advanced Engines for Tomorrow's Transportation Needs." Participants included researchers at Sandia's Combustion Research Facility (CRF) and Joint BioEnergy Institute (JBEI), as well as representatives from oil companies, biofuel developers, engine manufacturers, suppliers, and experts from the university, regulatory, finance, and national laboratory communities.

The full report is now available online at [www.sandia.gov/news/publications/white-papers](http://www.sandia.gov/news/publications/white-papers).

The workshop, says Ron Stoltz (8302), was designed to identify opportunities for codevelopment of biofuels and engines, an often overlooked issue.

"The oil companies and the automobile and truck engine companies have engaged in a dialogue and collaboration on fuel and engine issues for almost 100 years," Ron says. "But the same cannot be said for the majority of biofuel start-up companies, especially those that are thinking 'beyond ethanol.' The report highlights how fragmented the biofuels industry is today



and how, by putting serious thought behind some key issues like fuel chemistry linked to engine performance, great strides can be made."

The primary goal of the workshop, Ron says, was to foster dialog among researchers and experts from industry, academia, and government, with the ultimate hope of finding ways to accelerate the transition to biofuels.

Workshop participants agreed that a series of key attributes are necessary to make the introduction of next-generation biofuels a reality in the transportation sector. Biofuels, they concluded, must be:

- Clean (at or below EPA-designated pollutant criteria)
- Sustainable (a CO<sub>2</sub> footprint below that of the petroleum-based fuels being displaced)
- Compatible (with current and future engine designs and with current and future distribution infrastructure)

Among other observations, participants also concluded that a consolidated, federally funded research program on biofuels and advanced engine concepts is necessary to accelerate the transition to biofuels.

Four key recommended actions emerged from the workshop:

*"The report highlights how fragmented the biofuels industry is today and how, by putting serious thought behind some key issues like fuel chemistry linked to engine performance, great strides can be made."*

— Sandia researcher Ron Stoltz

- 1) Modernize the testing, specification, and certification of all fuels.
- 2) Plan and integrate the research and development of next-generation biofuels in conjunction with the development of advanced engines.
- 3) Develop specific guidelines, roadmaps, and objectives for codevelopment of next-generation biofuels and advanced engines.
- 4) Convene an International Fuels and Engines Summit, sponsored by industry with government and university participation, to ratify a fuels/engine strategy and implementation framework.

Bob Carling, director of Transportation Energy Center 8300, says Sandia's role as a national laboratory is to look to the future and inform policymakers and others about the potential of advanced technologies and the technical challenges that stand in the way of commercialization.

"In the biofuel arena, or more generally advanced liquid fuels, the need is to understand how chemistry has an impact on the performance of any advanced fuel, either through efficiency gains or losses while meeting current emission regulations," says Bob. "Sandia will continue to work with the scientific and engineering community as new, advanced liquid fuels are being developed. We want to integrate the community's research into our work as we develop increased knowledge and understanding of chemistry and its role in new internal combustion engine architectures."

## Josie Chavez honored by SPO peers



**THANKS, JOSIE** — Security Police Officer Josie Chavez accepts congratulations from Div. 4000 VP Mike Hazen during ceremonies this week at the Steve Schiff Auditorium. This year, Sandia's Protective Force marks 60 years of service to Sandia and the nation and Josie has been a part of the force for more than 30 of those 60 years. Josie, the first uniformed woman on the force, has become the all-but-official historian of the security team. An upcoming issue of the *Lab News* will feature a look back at some of the highlights of the Pro Force's 60 years of exceptional service. (Photo by Randy Montoya)



BACKGROUND ARTWORK BY 2009 1ST PLACE WINNER ANISSA LAVERA SOUTH VALLEY ACADEMY CHARTER HIGH SCHOOL

## DIVERSITY AWARENESS EVENT

"HISPANIC HERITAGE MONTH"

TUESDAY- OCTOBER 5TH- 2010

11:00 AM-1:15 PM

STEVE SCHIFF AUDITORIUM

SALSA/CHILE/CULTURAL DESSERT TASTING CONTEST

MUSIC ENTERTAINMENT

FOOD FOR PURCHASE: CERVANTES RESTAURANT

\$6 PER PLATE FOR RED CHILE ENCHILADAS. GREEN CHILE CHICKEN ENCHILADAS. BEANS, RICE, TORTILLA AND DRINK.

Sandia National Laboratories

# Technology Ventures Corp. courses teach Sandians about entrepreneurship, tech-based startups

By Heather Clark

Sometimes it doesn't matter how great an idea is or that a technical gadget is the latest greatest thing to hit the market — commercializing them can still be tough. But Technology Ventures Corp. (TVC) is offering seven Center for Commercialization & Entrepreneurial Training (CCET) courses this fall to help Sandia researchers navigate fickle markets, the so-called "Valley of Death," and other challenges that await would-be entrepreneurs on their way to successful startups.

The free classes — sponsored by Intellectual Property Management, Alliances & Licensing (1931) — begin Thursday, Oct. 7. They will be held 11:30 a.m.-1 p.m. in the Bldg. 823 breezeway and include a free lunch.

Lee Trussell, TVC's director of entrepreneurial training, says the main goal of the classes is to attract would-be entrepreneurs at Sandia to TVC, a nonprofit, charitable foundation funded by Lockheed Martin Corp. and DOE to commercialize technologies and create jobs. Since its inception in 1993, TVC has served as an intermediary between private investors and innovators from the Labs who are seeking equity capital to commercialize their ideas.

"Helping those people who have a desire to take a technology out of the national laboratories is our primary objective," Trussell says. "Second, is to teach those people about business administration — how to form, finance, and manage a business organization."

In a CCET class taught in July, John Freisinger, TVC's director of business assistance, delivered high-energy instructions to participants on making lemonade, taking them through a step-by-step process that gave the researchers insight on how an entrepreneur would approach the process to produce a value-added product to sell.

Freisinger told the participants that people come to him with ideas all the time, but few ever turn those ideas into startups.

"Most people never make the first step from idea guy to entrepreneur because they are afraid of one thing: They are afraid to take off their jackets and do a little work," he told the class.

The classes don't sugarcoat the process of commercializing technology. For example, Suzanne Roberts, TVC's project director, told participants about what entrepreneurs call the Valley of Death, the time between the creation of the technology and commercialization.

During that period, funding can dry up, the market can shift, making the product obsolete, the economy can tank, and snafus in manufacturing or problems with intellectual property can emerge, but TVC maintains that proper planning and research can give would-be entrepreneurs a better chance at success,



TECHNOLOGY VENTURES CORPORATION  
Enabling Innovation • Accelerating Investment  
Founded by Lockheed Martin Corporation

Roberts said.

Mary Green (6411), who designs security systems for high-risk facilities and is a graduate of the CCET classes, says she liked that instructors were candid about the difficulties of commercializing technology.

"One thing that I did appreciate was they didn't hide the fact that just because you want to go into business doesn't mean you're going to be successful," Mary says. "While I've had fascinating, interesting challenges here at Sandia, I think running your own business is a lot harder."

Despite the difficulty of launching startups, TVC has helped form 112 new businesses, has helped create nearly 13,000 jobs, and has helped its client companies obtain \$1.15 billion in investments.

Trussell says about 15,000 people have taken CCET classes in Albuquerque, Santa Fe, Rio Rancho, Los Alamos, Las Vegas, Nev., Livermore, Calif., and Idaho Falls, Idaho, since 2003. In October 2009, TVC brought the classes into the Labs so more Sandians could participate, he says.

Trussell says another goal of the classes is to teach scientists and engineers about the language and challenges of the business world. Sandians who work with outside companies on cooperative research and development agreements (CRADAs) or Work for Others (WFOs) can benefit from the classes by increasing their understanding of contracts and business administration.

"The better they understand business, the more effective they will be for Sandia," he says. "The more skills you gain, the more effective an employee, manager, or leader you become."

Dave Schnizlein (5535), a computer software researcher and developer, and other Sandians interviewed say the class where they heard from entrepreneurs themselves was the most informative part of the series.

Other than hearing about the firsthand experiences, Dave says, "The most helpful thing for me was the summary of the nitty gritty things of starting a business, the different types of businesses you can have, how you're supposed to register them, the information about copyrights, licensing, and trademarks."

To register for the upcoming classes, RSVP to Margaret Speer at 843-4202 or margaret.speer@lmco.com.

*"Most people never make the first step from idea guy to entrepreneur because they are afraid of one thing: They are afraid to take off their jackets and do a little work."*

— TVC official John Freisinger

## CCET class schedule

The CCET classes offered this fall will start Thursday, Oct. 7, and continue weekly through Thursday, Nov. 18. All classes are 11:30 a.m.-1 p.m. in the Bldg. 823 breezeway. Lunch will be provided.

**Oct. 7** — Technology Transfer Practices: An introduction to entrepreneurial services at Sandia and TVC.

**Oct. 14** — Entering the Entrepreneurial World: A look at the concepts and issues of commercializing a technology-based product, including analyzing its business and financial potential.

**Oct. 21** — Preparing and Presenting a Business Plan: A step-by-step guide through the process of developing and writing a business plan directed toward achieving equity financing for the innovation and company.

**Oct. 28** — Market Research and the Marketing Plan: A discussion of how to determine the market potential of a product, how to understand the dynamics in the marketplace, and how to produce a marketing plan.

**Nov. 4** — Financial Management: An exploration of how to raise capital, understand and use financial statements, prepare budget projections and pro forma financial statements, and determine company valuation.

**Nov. 11** — Operations Startup and Organization Structure: A description of the business organization development process and the essential legal, accounting, taxation, and securities issues.

**Nov. 18** — Attracting Equity Investors and Lessons Learned: A look at developing relationships with investors and protecting intellectual property, and lessons directly from those who have experienced the equity funding process.

## Computing grants

(Continued from page 1)

• **Robert Armstrong (8961)** will receive an **\$834,000 grant** for his project, "COMPOSE-HPC: Software Composition for Extreme Scale Computational Science and Engineering," in the category of X-Stack Software Research. (X-Stack refers to the scientific software stack that supports extreme-scale scientific computing, from operating systems to development environments.)

• **Kenneth Moreland (1424)** will receive a **grant of \$598,406** for "A Pervasive Parallel Processing Framework for Data Visualization and Analysis at Extreme Scale," in the category of Scientific Data Management and Analysis at Extreme Scale. Writes Ken, "The road to exascale computing necessitates a fundamental shift in the underlying architecture of the computing platforms. The extreme level of concurrency required to drive these machines effectively challenges the way we engineer our software. In particular, our current visualization systems, which rely on a coarse partitioning of data to perform parallelism, will not scale to an exascale system. This is a project to design a new programming paradigm that guides visualization algorithms to be developed with pervasive parallelism, an intrinsic parallel design that pervades all parts of the algorithm and implementation. The programming paradigm is based on functors, small stateless functional units, that can be developed and tested as serial units but also parallelized indefinitely and chained together to maximize the operation-to-memory-fetch ratio."

• **Ronald Minnich (8961)** will receive **\$615,000** for "A Fault-oblivious Extreme-scale Execution Environment," in the category of X-Stack Software Research. Writes Ron, "The Fault Oblivious X-stack project is led by Sandia and includes Los Alamos National Laboratory, Pacific Northwest National Laboratory, Ohio State University, Boston University, IBM, and Bell Labs. The goal is to build an HPC system software stack that runs correctly even as faults occur. The software will not respond to faults; rather, it will be oblivious to them. An example of such obliviousness can be found in your computer: your computer and memory have errors almost continuously, but due to the hardware design you can run as though they never occurred. Our goal is to bring this type of environment to the software used in HPC."

• **Kevin Pedretti (1423)** will receive **\$572,500** for "Enabling Exascale Hardware and Software Design through Scalable System Virtualization," in the category of X-Stack Software Research. Kevin writes, "The objective of this project is to apply scalable system virtualization techniques to enable the wide range of innovation necessary to realize productive exascale computing. In particular, a scalable virtualization platform would enable other X-stack researchers to easily test prototype system software stacks on today's production supercomputers, something that is difficult today. It would also enable potential architectural innovations to be tested at scale as extensions to the virtual machine. This project is derived in part from an FY08-FY10 Laboratory Directed Research and Development project examining the use of virtualization on high-end supercomputers, such as the Red Storm machine at Sandia. The project involves researchers at the University of New Mexico, Northwestern University, and Oak Ridge National Laboratory. Total funding for this three-year project is \$2.5 million."  
— Neal Singer

# Mileposts

New Mexico photos by Michelle Fleming



William Drotning  
35 6471



Allison Davis  
30 522



John Kelly  
30 6770



Steven Lautenschleger  
30 5403



Pamela Mincey  
30 4847



David Swahlan  
30 6475



Todd Criel  
25 5425



Michael Firreno  
25 2663



John Ledwith  
25 2700



Rebecca March  
25 10616



Kathryn Olson  
25 9532



Jeff Tsao  
25 1120



Cynthia Blain  
20 5339



Daren Davidson  
20 5417



Gertrude Gutierrez  
20 10501



Curtis Nelson  
20 5349



Cindy Olson  
20 900



Sam Bono  
15 3652



Ronald Brightwell  
15 1423



Victor Echeverria  
15 5622



Curt Kuper  
15 2661



Daniel Small  
15 6473



William Stubblefield  
15 1433

# Recent Retirees



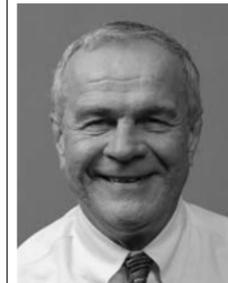
Tom Blejwas  
30 9700



Rose Mary Gurule  
26 9548



Steven Humphreys  
25 5528



Gary Zura  
14 10010



## TAKECHARGE → 2011 health care plan administrators

Beginning Jan. 1, 2011, Sandia's medical plans available to all active nonrepresented employees and preMedicare retirees will be administered by United-Healthcare (UHC), Blue Cross and Blue Shield of New Mexico (BCBSNM), and Kaiser Permanente. Nonrepresented employees and preMedicare retirees will have the choice of the Sandia Total Health administered by UHC, BCBSNM, or Kaiser Permanente. As previously stated, more than 90 percent of the providers (hospitals, doctors, physicians, specialists, etc.) currently being used by employees and preMedicare retirees are part of the 2011 networks.

While the Sandia Total Health plan design (Health Reimbursement Account, annual deductible, coinsurance, out-of-pocket maximum) will be the same regardless of which claims administrator you choose, there will be differences in networks. As a reminder, the current medical plans Sandia offers today — UHC Premier PPO, CIGNA In-Network Plan, and Kaiser HMO (in California) — will no longer be offered to nonrepresented employees and preMedicare retirees, effective Jan. 1, 2011. All three plans will be replaced by Sandia Total Health administered by UHC, BCBSNM (which is replacing CIGNA), or Kaiser.

All union-represented employees will have the choice of the UHC Standard Preferred Provider Organization (PPO), the UHC Premier PPO, and the BCBSNM In-Network Plan. SPA union-represented employees will have the additional option of the Sandia Total Health administered by either UHC or BCBSNM. The plan design for the BCBSNM in-network plan will remain the same as the current CIGNA in-network plan.

For more information, visit [www.SandiaTakeCharge.com](http://www.SandiaTakeCharge.com).

## Benefit fairs and presentation schedule for retirees and surviving spouses

### Benefits Choices 2011 retiree pre-Open Enrollment sessions

#### Albuquerque, New Mexico

Retiree open enrollment is Oct. 18 - Nov. 16

All Albuquerque events listed in the schedules below will be held at the University of New Mexico Continuing Education Conference Center, 1634 University Blvd. NE, just north of Indian School Road. For map and directions, visit <http://dce.unm.edu/location-maps.htm>.

(Note: Livermore sessions have already been held)

#### PreMedicare retirees

All preMedicare retirees must complete a health assessment (which includes biometric screening information) to receive the full HRA contribution. Sandia Preventive Health clinicians will be available at all preMedicare retiree sessions to conduct biometric screenings. You may complete either a nonfasting screening or a fasting screening that requires a 12-hour fast.

Date	Presentation Schedule	Biometric Screening schedule
Sept. 24 (Friday)	9-11 a.m. MT	8 a.m.-noon MT
Sept. 30 (Thursday)	9-11 a.m. MT	8 a.m.-noon MT
Oct. 1 (Friday)	9-11 a.m. MT	8 a.m.-noon MT
Oct. 4 (Monday)	9-11 a.m. MT	8 a.m.-noon MT

#### Medicare primary retirees

Date	Presentation Schedule	Audience
Sept. 24 (Friday)	1-3 p.m. MT	Last name begins A-E
Sept. 30 (Thursday)	1-3 p.m. MT	Last name begins F-L
Oct. 1 (Friday)	1-3 p.m. MT	Last name begins M-R
Oct. 4 (Monday)	1-3 p.m. MT	Last name begins S-Z
Oct. 5 (Tuesday)	9-11 a.m. MT	All Medicare primary retirees welcome
	1-3 p.m. MT	All Medicare primary retirees welcome
Oct. 7 (Thursday)	9-11 a.m. MT	All Medicare primary retirees welcome
	1-3 p.m. MT	All Medicare primary retirees welcome

# Education changes the face of homelessness

Stories by Iris Aboytes

Excitement filled the air as schoolchildren lined up on their first day of school. Many were wearing new shoes and clothes and all were carrying lots of school supplies. There were other school-age children who didn't have new shoes or clothes; they didn't even have an address, so they could not get enrolled for school.

Who are these children?  
 "Children and youth are considered homeless if they live in transitional or emergency shelters, motels, cars, abandoned buildings, or other inadequate accommodations," says Helen Fox, director of the Albuquerque Public Schools (APS) Title I Homeless Project. "Many families experience unemployment, job changes, or other circumstances that can cause the loss of a permanent home."

Title I is a federally funded program designed to meet the needs of students primarily in the areas of language arts, math, and higher thinking. Homeless children are eligible for these services regardless of school attendance area. Title I provides the means, motivation, and encouragement needed for homeless students to reach their potential.

"How would you feel if you were not wearing clean clothes, had not had a bath in a while, had no school supplies, had serious nutrition problems, hadn't eaten, and were sent to school?" says Fox. "Would you be welcomed? Would you feel like you belong? Would you be the best student?"

"Through Title I we work at making the kids whole. Evening programs help children who, because of circumstances, lag behind. Title I goes out to try to find the kids. The kids won't come to Title I."

"Among the agencies we partner with are Hogares, All Faiths Receiving Home, A New Day, First Nations, Healthcare for the Homeless, and Healing the Children," adds Fox. "Our goal is to make homeless children realize that through education they have a future. We will do anything to help the children. Last year we had about 3,000 home visits."

About 5,000 homeless kids were enrolled in APS last year. "That is the size of two of the city's biggest high schools in Albuquerque," adds Fox.

"Imagine being an 8-year-old girl, the oldest of four children, you live in a car and you care for your mom who has lots of problems. How do you get help? How can you just be a kid and go to school?"

"To change the face of homelessness, kids need to be educated," says Fox. "With the help of our partner agencies we try to get these children to feel whole."



## APS Title I Homeless Project

**Additional programs in place**

- Tutoring at 14 schools in APS with meals and transportation provided for all tutoring sites
- Preschool program serving homeless children whose living circumstances are particularly mobile.
- Resource teachers and outreach workers from the project supporting students at school sites with backpacks, supplies, uniforms, school fees, and other needs.
- Health/mental health services provided through collaboration with private, not-for-profit community

agencies.

- A two-week June program emphasizing academics, career exploration, and recreational activities.
- A three-week July program emphasizing literacy for elementary students.

All of these services have contributed to increased school success for students. More students are accessing tutoring and health/mental health services. The middle school students are identifying and pursuing more diverse and advanced career choices, and graduation rates are climbing.

## When the human spirit prevails, a new and stronger life is born

When Rachel was 14 years old, she was raped by three men and ended up in the hospital. She tried to commit suicide. Her mother's boyfriend thought she was just trying to get attention. "They kicked me out when I was 15," she says.

"I was 15 and homeless. The first night was the worst. I slept in my car without a lock and heater. I did not know what to do or where to go. I joined a gang and was on drugs until 17, when I got cleaned up."

Working three jobs, Rachel lived in her car and continued to attend school. Every two weeks, she would go early so that nobody would see her showering in the school gym. Other times, she would stay over at her friends' homes and shower there.

"I went a whole week without eating and lost 20 pounds," she says.

Because of her jobs and not getting enough rest, many times she would doze off in class and always felt tired. She did not share her situation with anybody, so her teachers did not understand. Sometimes she got into trouble.

"The worst part of being alone is not being able to share," says Rachel. "Nobody is there, so you just break down and cry."

"I had no childhood. I missed having a family, people being there no matter what, in any instance. I would like to have focused on school instead of where I was going to stay at night, what I was going to eat,

and where I going to take a shower in the morning.

"People don't understand homeless people. Homeless people try, too. Just because the homeless don't shower or can't wash their clothes; most people only see a druggie or alcoholic. They don't see somebody trying to survive."

"I didn't want to be a homeless person; I wanted to belong to a family."

"In high school, I had no dreams, goals," says Rachel. "Title I helped me believe that I could have and achieve dreams. Even one homeless student can have a dream. I am living my dream, by going to school."

West Mesa High School and the Title I Homeless Project helped Rachel get to the point in her life where she was able to apply for a scholarship, says Helen Fox, director of the APS Title I Homeless Project.

"We even set up a panel for her to practice her interviews. On interview day, we took her to breakfast, had her hair done, and were with her as she went to her interview. We are very proud of Rachel," Fox says.

Rachel is now a sophomore at the University of New Mexico. She was awarded 12 scholarships. She is no longer homeless.

"Today, instead of thinking where I am going to sleep or eat, I think of how I can make a difference. In a few years I hope to have traveled, had a family, and my career."



### Domino Dare

Domino Falling Competition



**Date**

Tuesday, October 5th

**Time**

Set up begins at 8:00  
 Contest at 11:00-12:30

**Location**

East Fitness Center  
 (corner of F & Texas, next to the bowling alley) Badge must be presented to enter

**Additional Info**

Winning team will have a face-off with Intel Team

**Join Us!**

Teams will compete on technical excellence and creativity of their falling domino display

**Rules:**

- Ten teams will represent Divisions
- Kirtland AFB will also participate
- Each will receive 500 dominos
- Each display will be allocated a 10 x 10 ft. space
- You may use other equipment, props, pieces, etc. in design
- No electricity provided
- Set up time is day of event
- Use your imagination
- Judges' decisions are final

**Need Ideas?**

Search web on "Domino Competition" to see fun ideas of what others have created

**Why?**

Fun, excitement and campaign awareness that every person in the chain makes a difference.

**Contact:**

pcatana@sandia.gov, 284-5211  
 Or your Division ECP Representative for more information.

Thank you Central New Mexico for Creating a Domino Effect of Giving



Sandia's 2010 ECP/United Way

Employee Caring Program

# Book Fair

See what's new!

Shop in the convenience of your workplace. Save on an incredible selection of books and fine gift items. Bring your shopping list to the book fair! You'll find exactly what you want in our large selection.



JOIN THE CHAIN  
 SEE THE REACTION

**IPOC - 2nd Floor Break Room**

Tuesday thru Thursday  
 October 5th, 6th & 7th  
 10:00 am - 4:00 pm

**Steve Schiff Auditorium**

Monday thru Wednesday  
 October 11th, 12th & 13th  
 10:00 am - 2:00 pm

**Thunderbird Cafeteria**

Tuesday thru Thursday  
 October 19th, 20th & 21st  
 10:00 am - 2:00 pm

